Building a better future
Global Leader

HYUNDAI

H RUN N700E

INVERTER

TECHNICAL SPECIFICATIONS

HYUNDAI
HEAVY INDUSTRIES CO.,LTD.

Clean Power
Hyundai Inverter

For the highest quality,
for the highest customer satisfaction

HiRUN N700E

HYUNDAI N700E series inverter with high durability, exceptional speed control and torque response, providing overall superior Vector Performance.

The N700E's compact size and sensorless vector control technology provide perfectly optimized performance for industrial / commercial equipment.

Certificates of international standards (CE, UL/cUL) of N700E series make its applications ready for global business.

Model Name Indication

Model Name Indication

N700E | 055 | LF | R

- N700E — Series name
- 055 — Applicable motor capacity
  - 004 : 0.4kW
  - ⌇ ⌇
  - 055 : 5.5kW
  - ⌇ ⌇
  - 3500 : 350kW
- LF — Power source
  - SF: 1-Phase, 220V
  - LF: 3-Phase, 220V
  - HF: 3-Phase, 440V
- R — Add Option
  - R: DC Reactor

Note: DC Reactor option for 30~132kW

Model Configuration

Applicable motor capacity (kW)	1-Phase, 220V	3-Phase, 220V	3-Phase, 440V
0.4	N700E-004SF	N700E-004LF	N700E-004HF
0.7	N700E-007SF	N700E-007LF	N700E-007HF
1.5	N700E-015SF	N700E-015LF	N700E-015HF
2.2	N700E-022SF	N700E-022LF	N700E-022HF
3.7		N700E-037LF	N700E-037HF
5.5		N700E-055LF	N700E-055HF
7.5		N700E-075LF	N700E-075HF
11		N700E-110LF	N700E-110HF
15		N700E-150LF	N700E-150HF
18.5		N700E-185LF	N700E-185HF
22		N700E-220LF	N700E-220HF
30			N700E-300HF
37			N700E-370HF
45			N700E-450HF
55			N700E-550HF
75			N700E-750HF
90			N700E-900HF
110			N700E-1100HF
132			N700E-1320HF
160			N700E-1600HF
220			N700E-2200HF
280			N700E-2800HF
350			N700E-3500HF

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☐ Improved Control Performance

High Torque Performance in Ultra Low Speed Zone by Using Sensorless Vector Control

- ☐ Hyundai's advanced sensorless vector control technology provides a motor with high torque performance in ultra low speed zone (Sensorless vector control: above 150% at 1Hz).
- ☐ In case of fast acceleration/deceleration of motor, N700E series provides powerful torque controllability without trip.
- ☐ Sensorless vector control technology expands the range of controlling speed.

Superb Speed Control Performance by Improved Tuning Technology for Motors

- ☐ Through technology of compensating the motor time constant while motor tuning minimizes the speed change, stable motor opeation can be achieved.

Intensified Protective Functions for Safety while Running

- ☐ Ground fault protection can prevent accidents.
- ☐ Countermeasure for output's phase loss protects motor while running.

Built-in Regenerative Braking System

- ☐ BRD is basically equipped with the inverter so that the easy operation for acceleration/deceleration time is achieved without additional options.
- ☐ Driving performance of acceleration and deceleration maximizes efficiency.

Enhanced Flexibility for Various Loads

- ☐ Built in PID function uniformly controls oil pressure and flow quantity without additional options.
- ☐ Improved torque characteristic, which is reduced to the 1.7th power, perfectly fits with loads for fans and pumps.
- ☐ Optimized energy saving according to the characteristics of loads is achieved.

Various Inverter Display Functions

- ☐ The operational status of the inverter are displayed on the monitor so that an user can understand the condition of the inverter.
- ☐ Cumulative hours of driving time and the actual running time are displayed for easy maintenance.

Convenient Maintenance and Repair

- ☐ N700E is available to replace the fan without separation.
- ☐ Fan on/off function increases fan's durability and minimizes fan's noise.

220V 1-Phase/3-Phase

Inverter Model (N700E-□□□□□)		004SF	007SF	015SF	022SF	004LF	007LF	015LF	022LF	037LF	055LF	075LF	110LF	150LF	185LF	220LF
Max. Available motor(4P, kW)	Heavy Duty	0.4	0.75	1.5	2.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0
	Normal Duty	-	-	-	-	-	-	-	-	-	7.5	11.0	15.0	18.5	22.0	-
Rated Capacity(kVA)	Heavy Duty	1.2	2.1	2.9	4.6	1.2	2.1	2.9	4.6	7.1	10.0	13.3	18.7	26.6	31.6	37.4
	Normal Duty	-	-	-	-	-	-	-	-	-	12.5	18.2	24.1	30.3	35.3	-
Rated Input AC Voltage		1-Phase 200~240V±10%, 50/60Hz±5%				3-Phase 200~240V±10%, 50/60Hz±5%										
Rated Output Voltage		3-Phase 200~240V(Depend on receiving voltage)				3-Phase 200~240V(Depend on receiving voltage)										
Rated Output Current(A)	Heavy Duty	3	5	7	11	3	5	7	11	17	24	32	45	64	76	90
	Normal Duty	-	-	-	-	-	-	-	-	-	30	44	50	73	85	-
Brake	Recover Brake	Built in Brake Circuit(Need to Additional Brake Resistor)				Built in Brake Circuit(Need to additional brake resistor)										
	Resistance(Ω)	50	50	50	50	50	50	50	50	35	17	17	17	8.7	6	6
Weight(kg)		1.2	1.2	1.5	1.5	1.2	1.2	1.2	1.5	2.0	4.2	4.5	4.5	6.5	7.5	8.0

440V 3-Phase

Inverter model (N700E-□□□□□)		004HF	007HF	015HF	022HF	037HF	055HF	075HF	110HF	150HF	185HF	220HF
Max. Available motor(4P, kW)	Heavy Duty	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0
	Normal Duty	-	-	-	-	-	7.5	11.0	15.0	18.5	22.0	30.0
Rated Capacity(kVA)	Heavy Duty	1.5	2.8	4	6	7.6	10.0	13.3	19.1	26.6	31.6	37.4
	Normal Duty	-	-	-	-	-	12.5	18.2	24.1	30.7	35.7	47.3
Rated Input AC Voltage		3-Phase 380~480V±10%, 50/60Hz±5%										
Rated Output Voltage		3-Phase 380~480V(Depend on receiving voltage)										
Rated Output Current(A)	Heavy Duty	1.8	3.4	4.8	7.2	9.2	12	16	23	32	38	45
	Normal Duty	-	-	-	-	-	15	22	29	37	43	57
Brake	Recover Brake	Built in Brake Circuit(Need to additional brake resistor)										
	Resistance(Ω)	180	180	180	100	100	70	50	50	30	20	20
Weight(kg)		1.5	1.5	1.5	1.5	2.0	4.2	4.5	4.5	7.0	7.0	7.5

440V 3-Phase

Inverter model (N700E-□□□□□)		300HF	370HF	450HF	550HF	750HF	900HF	1100HF	1320HF	1600HF	2200HF	2800HF	3500HF
Max. Available motor(4P, kW)	Heavy Duty	30	37	45	55	75	90	110	132	160	220	280	350
	Normal Duty	37	45	55	75	90	110	132	160	200	250	320	375
Rated Capacity(kVA)	Heavy Duty	48.2	62.4	74.8	91.5	123.9	146.3	180.4	216.2	230	315	400	500
	Normal Duty	58.1	70.1	87.2	112	133	162	191	245	285	360	470	550
Rated Input AC Voltage		3-Phase 380~480V±10%, 50/60Hz±5%											
Rated Output Voltage		3-Phase 380~480V(Depend on receiving voltage)											
Rated Output Current(A)	Heavy Duty	58	75	90	110	149	176	217	260	300	415	525	656
	Normal Duty	70	85	105	135	160	195	230	285	370	450	600	680
Brake	Recover Brake	Need to Setup Recover Brake Unit											
	Resistance(Ω)	Refer to Option Table (Page 32)											
Weight(kg)		22	22	27	30	50	50	60	60	110	110	170	170

Standard 200V, 400V Class

Specification			Description
Control Method [1]			Space vector PWM method
Output Frequency Range [2]			0.01~400Hz
Frequency Accuracy [3]			Digital: Max frequency ±0.01% Analogue: Max frequency ±0.1%
Frequency Resolution			Digital setting: 0.01 Hz (<100Hz), 0.1Hz (>100Hz) Analogue: Max frequency / 500 (when DC 5V input), Max frequency / 1,000 (DC 0~10V, 4~20mA)
V/f Characteristic			Base frequency: 0~400Hz free set Torque pattern selection available (constant torque / reduced torque)
Overload Capacity			150%, 1minute(Heavy Duty), 120%, 1minute(Normal Duty)
Acceleration/Deceleration Time			0.1~3,000sec (linear/curve selection available) 2nd Acceleration/Deceleration setting available
DC Braking			Performs between min frequency and established braking frequency. Level and time setting available
Input	Frequency Setting	Standard Operator	Set by volume up/down key. 1W, 1~2kΩ variable resistor. DC 0~10V (input impedance 10kΩ), 4~20mA (input impedance 250Ω).
		External Signal	
	Forward Reverse Start/Stop	Standard Operator	Run key / Stop key (change forward/reverse by function command).
		External Signal	Forward run/stop, reverse run/stop set by terminal assignment (1a, 1b selection available)
	Intelligent Input Terminal		FW (Forward), RV (Reverse),CF1~4 (Multi-speed), RS (Reset), AT (Analog input current / voltage Transfer), USP (Unattended Start Protection), EXT (External Trip), FRS (Free Run Stop), JG (Jogging Command), SFT (Software Lock Command), 2CH (2nd Acceleration/Deceleration), SET (2nd Motor Constants Setting)
Output	Intelligent Output Terminal		RUN (Run Signal), FA1 [Frequency Arrival Signal (at the set frequency)], FA2 [Frequency Arrival Signal (at or above the set frequency)], OL (Overload Advanced Notice Signal), OD (Output Deviation of PID Signal), AL (Alarm Signal)
	Frequency Monitor		Analog meter (DC0~10V full scale. Max. 1mA) Analog output frequency signal and analog output current signal Analog output voltage signal selection available.
	Alarm Output Contact		OFF when inverter alarm (b contact output) / Auto switch ON and OFF / Intelligent output terminal use available
Main Functions			Auto-tuning, AVR Function, V/F Setting, Curve Accel./Decel. Selection, Frequency Upper/Lower Limit, 6 Level Multi-speed, Start Frequency Set, Carrier Frequency Setting (0.5~15kHz), PID Control, Frequency Jump, Analog Gain Bias Control, Jogging Run, Electronic Thermal Level Control, Retry, Auto Torque Boost, Trip History Monitor, Software Lock, S-shape Accel./Decel., Frequency Conversion Display, USP, 2nd Control
Protective Functions [4]			Over-current Protection, Overload (electronic thermal), Over-voltage, Communication Error, Under-voltage, Output Short, USP Error, EEPROM Error, External Trip, Ground Fault, Temperature Trip
Environmental Conditions	Ambient Temperature		-10~50°C (over 40°C: set carrier frequency below 2.0kHz)
	Storage Temperature		-20~60°C (while transporting: short time)
	Ambient Humidity		Below 90%RH (non-condensing)
	Vibration		5.9m/s² (0.6G). 10~55Hz (JIS C0911 test methodology)
	Location		Less than 1,000m above sea level, Indoor (no corrosive gas, no flammable gas, no oil-drop, no-dust)
Options			Noise filter, DC reactor, AC reactor, Remote operator, Remote operator cable, Regenerative braking resistor

※ 1) Before control method setting A31 is set to 2 (sensorless vector control), the following instructions should be considered.
- Carrier frequency setting b11 should be above 2.1kHz.
- When you use motors below half capacity of max applicable motor capacity, it is hard to get sufficient quality.
- When over 2 motors are about to be operated, sensorless vector control cannot be applied.

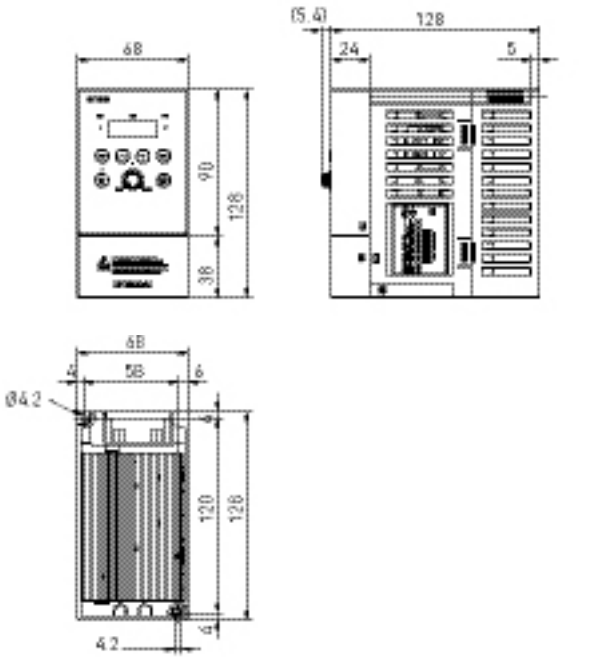
2) When you operate motor over 50/60Hz, inquire about maximum available rotational number.

3) For the purpose of stable motor control, output frequency can exceed approximately 1.5kHz at [A04]

4) Protective method is based on JEM1030.

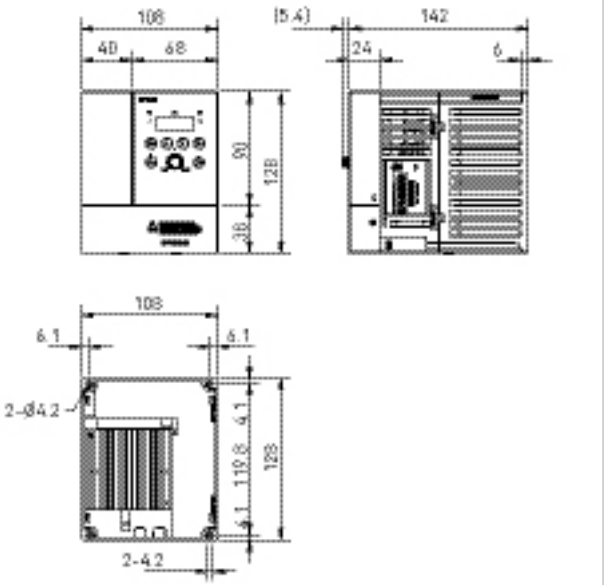
N700E-004SF/007SF, N700E-004LF/007LF/015LF

[Unit:mm]



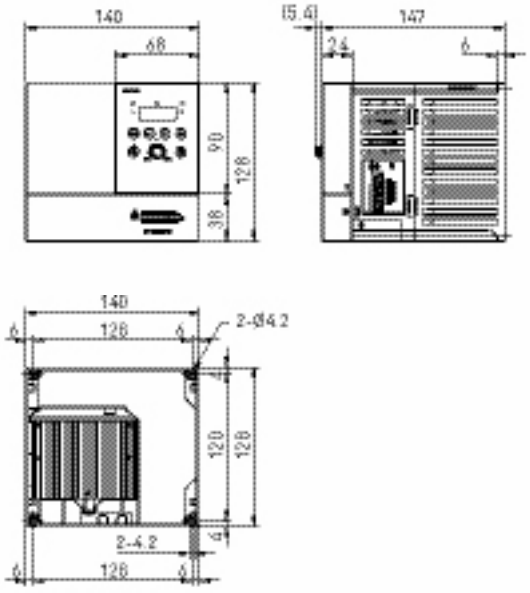
N700E-015SF/022SF, N700E-022LF, N700E-004HF/007HF/015HF/022HF

[Unit:mm]



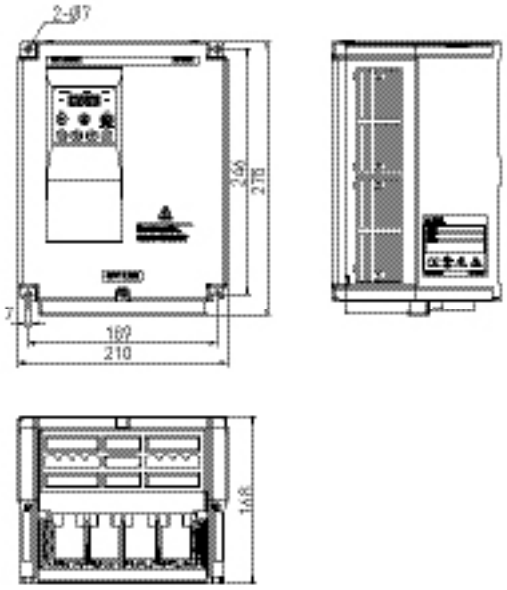
N700E-037LF/HF

[Unit:mm]



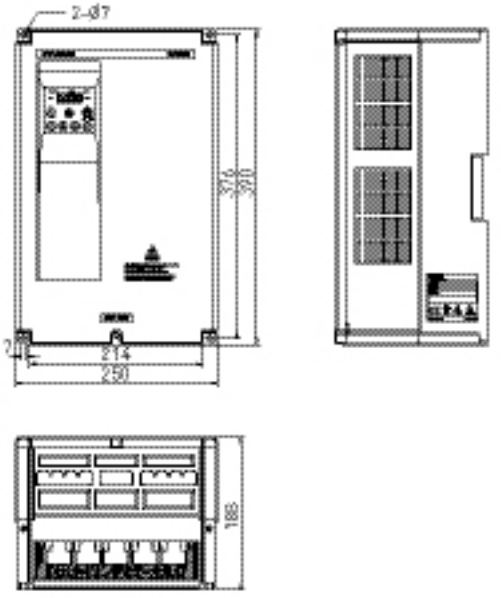
N700E-005LF/055HF, N700E-075LF/075HF, N700E-110LF/110HF

[Unit:mm]



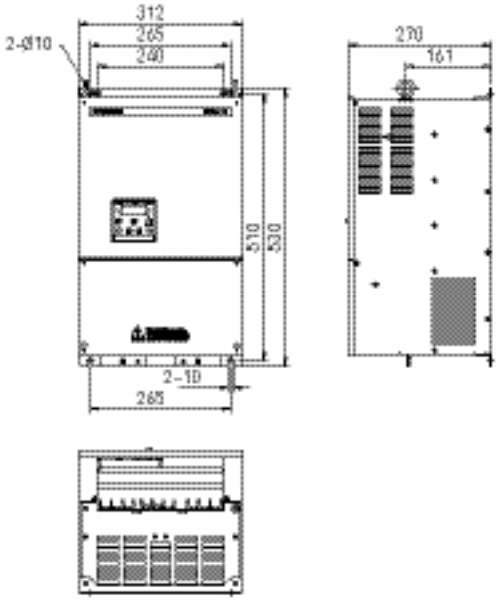
N700E-150LF/150HF, N700E-185LF/185HF, N700E-220LF/220HF

[Unit:mm]



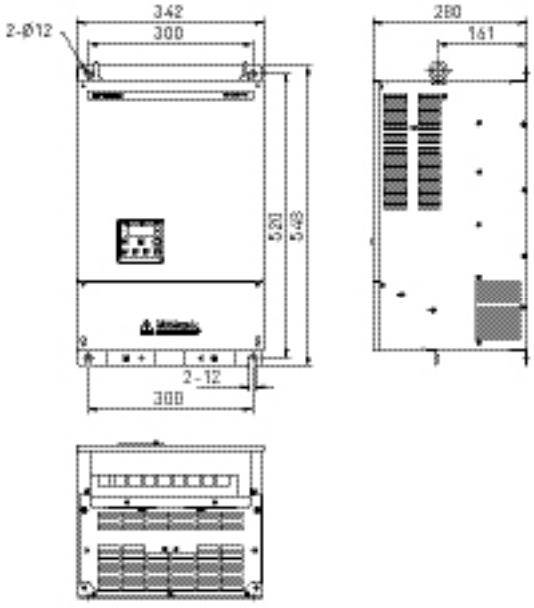
N700E-300HF, N700E-370HF

[Unit:mm]



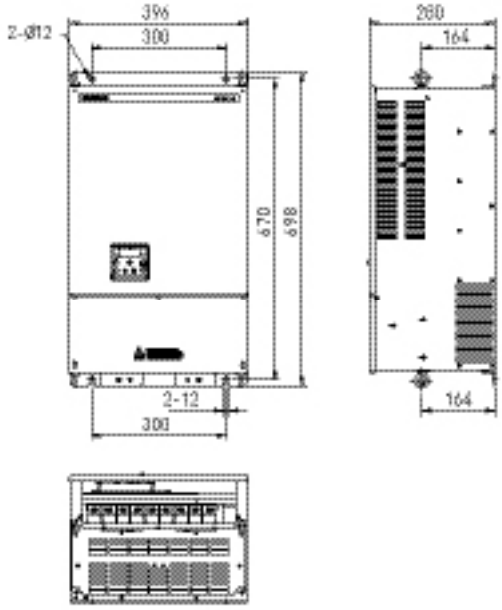
N700E-450HF, N700E-550HF

[Unit:mm]



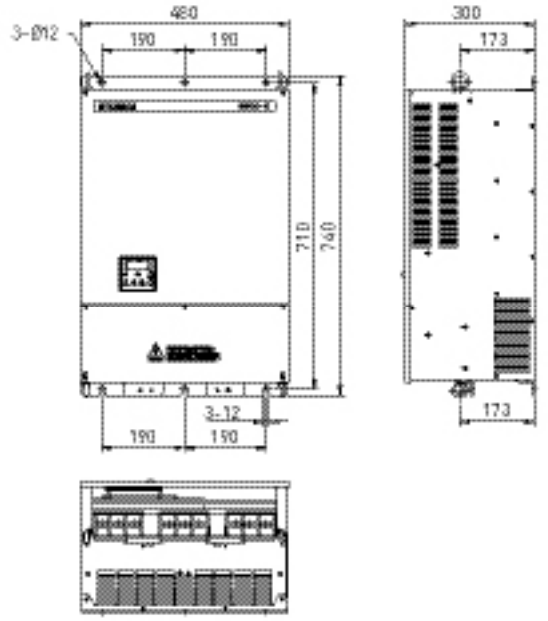
N700E-750HF, N700E-900HF

[Unit:mm]



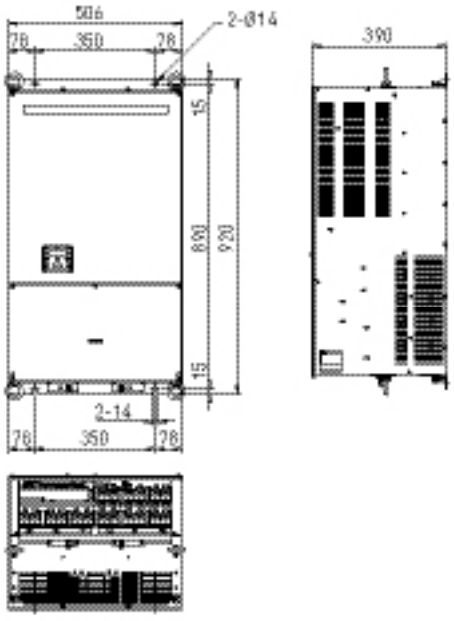
N700E-1100HF, N700E-1320HF

[Unit:mm]



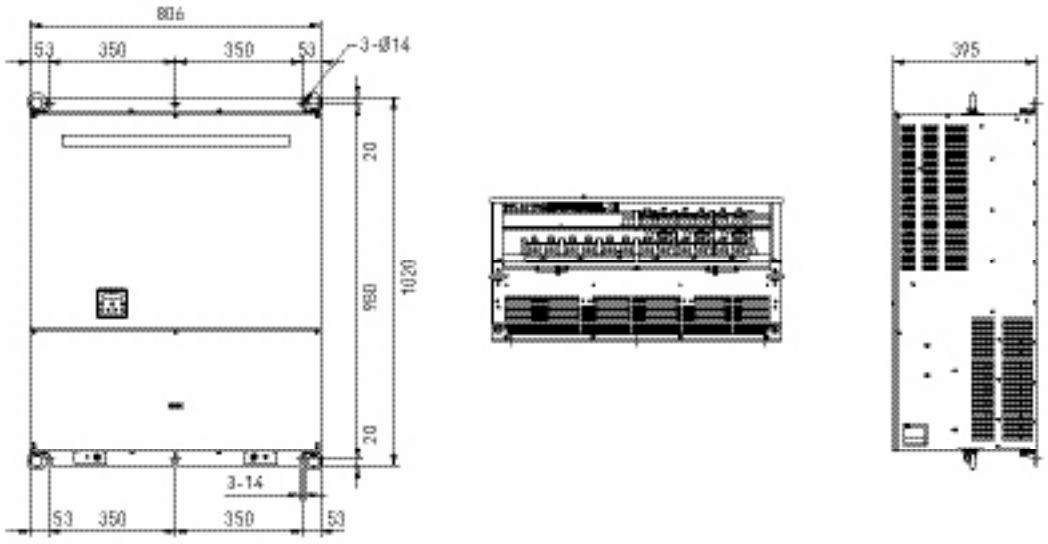
N700E-1600HF, N700E-2200HF

[Unit:mm]



N700E-2800HF, N700E-3500HF

[Unit:mm]



Operations

RUN LED
On when the inverter outputs the PWM voltage and operating command is ready.

POWER LED
On when the control power input to the inverter is on.

LED DISPLAY
Displays frequency, motor current, motor rotation speed, alarm history and setting value.

RUN KEY
Starts the motor and inverter. RUN key is disabled when the inverter is selected to run by control terminal input. RUN key is available only while the above LED is on.

FUNCTION KEY
Used for changing parameter and command.

UP / DOWN KEY
Increase/decrease frequency value and modify set values

PRG LED
This LED is on when the inverter is ready for parameter editing.

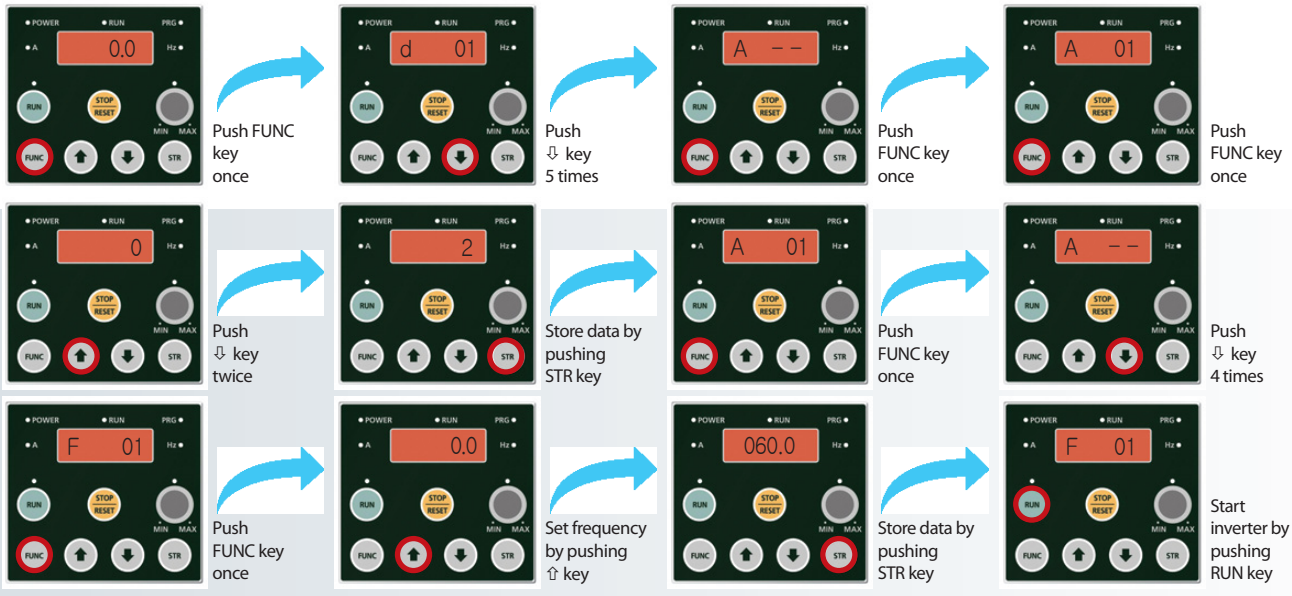
Hz LED / A LED
Shows whether the display is reading Hz or Amps.

STOP / RESET KEY
Used for stopping the motor or resetting errors. (When either operator or terminal is selected, this key works. If the extension function B15 is used, this function is void.)

POTENTIOMETER
Sets the inverter to output frequency.

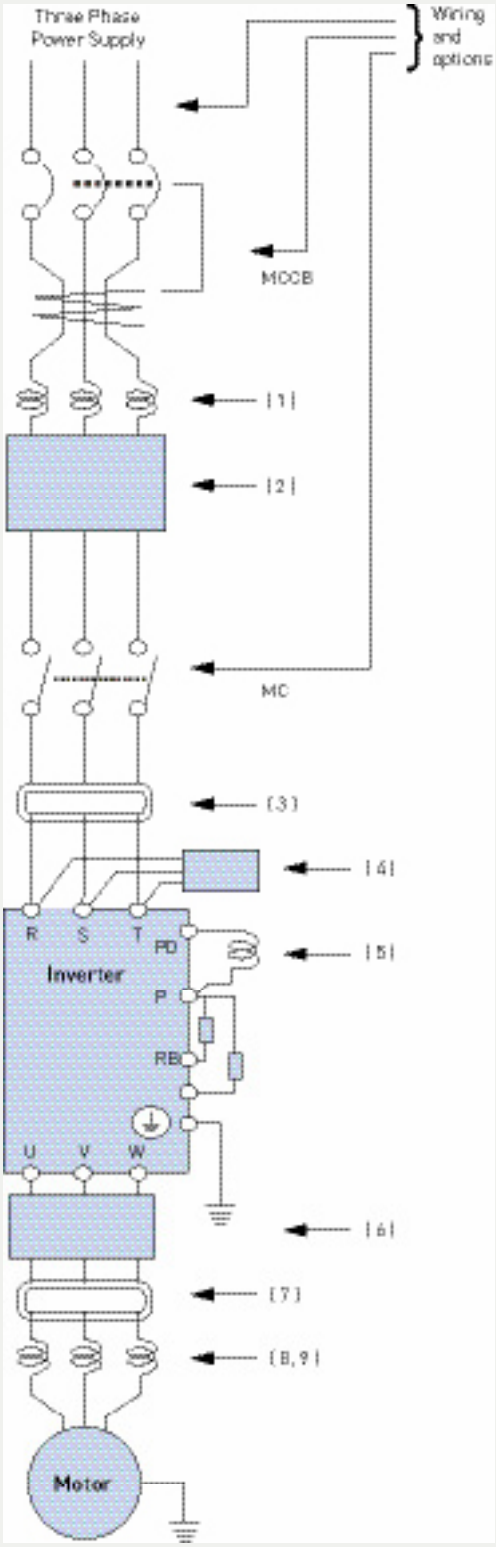
STORE KEY
Press the STORE KEY save the data and set value to memory.

Standard Operator Setting



Display Running Frequency

Wiring and Options



The sensitivity of circuit breaker (MCCB) should be differentiated by the sums of wiring distances (inverter-power supply and inverter-motor).

Wiring Distance	Sensitive Current(mA)
Under 100m	50
Under 300m	100

※ Applied wiring equipment represents HYUNDAI 3-phase 4-poles motor.
※ Braking capacity should be considered for circuit breaker.
※ When wiring distance is over 20m, there is need to apply large power cable.
※ Use circuit breaker (MCCB) for safety.
※ Do not perform ON/OFF function of electromagnetic contactor while inverter is in normal operating condition.
※ Use 0.75mm^2 for alarm output contact.
※ When wiring with metal tube using CV line, there exists 30mA/km current.
※ IV line has high non-dielectric constant : current increases 8 times. Therefore, 8 times greater sensitivity current , as shown in the table above, should be applied. When wiring distance is over 100m, use CV line.
※ ON/OFF operation is prohibited at the output side by using electromagnetic contactor. when it is necessary to apply electromagnetic contactor at the output side by using bypass circuit, protective circuit that prevents electromagnetic contactor from operating ON/OFF function should be applied while inverter is in normal operation.

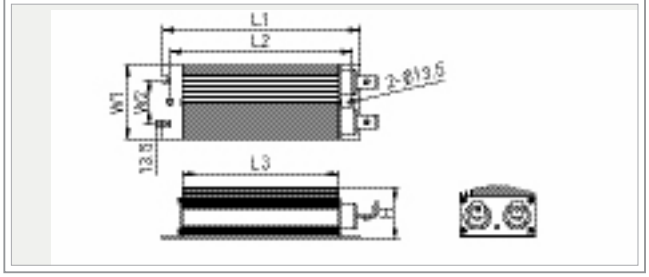
Order	Function Name	Description
(1)	Input-side AC Reactor (Harmonic Control, Electrical Coordination, Power-factor Improvement)	As a measure of suppressing harmonics induced on the power supply lines, it is applied when imbalance of the main power voltage exceeds 3% (and power source capacity is more than 500kVA), or when the power voltage is rapidly changed. It also improves the power factor.
(2)	Noise Filter for Inverter	This reduces common noise that is generated between input power and ground. Connect this filter to 1st side (input side) of inverter.
(3)	Radio Noise Filter (Zero-phase Reactor)	Electrical noise interference may occur on nearby equipment such as a radio receiver. This magnetic choke filter helps reduce radiated noise (can also be used on output).
(4)	Input Radio Noise Filter	This reduces radiated noise from Input power wirings.
(5)	DC Reactor	Suppresses harmonics generated by the inverter
(6)	Output-side Noise Filter	This reduces radiated noise from wiring in the inverter output side. This also reduces wave fault to radio and TV, and it is used for preventing malfunction of sensor and measuring instruments.
(7)	Radio Noise Filter (0-phase Reactor)	Electrical noise interference may occur on nearby equipment such as a radio receiver. This magnetic choke filter helps reduce radiated noise (can also be used on input).
(8)	Output AC Reactor to Reduce Vibration and Prevent Thermal Relay Misapplication	This reactor reduces the vibration in the motor caused by the inverter's switching waveforms, by smoothing the waveforms to approximate commercial power quality. When wiring from the inverter to the motor is more than 10m in length, inserting a reactor prevents thermal relay's malfunction by harmonic generated by inverter's high switching.
(9)	LCR Filter	Sine-wave shaping filter for the output side.

Brake Resister

Voltage	Inverter Model	Light Load			Heavy Load			Brake Unit
		Model Name	Resistor(Ω)	Capacity(kW)	Model Name	Resistor(Ω)	Capacity(kW)	
200V	N700E-004SF/LF	RB-00P3-50	50.0	0.3	RB-00P3-50	50.0	0.3	Default Inclusion
	N700E-007SF/LF							
	N700E-015SF/LF							
	N700E-022SF/LF	RB-00P3-50	50.0	0.3	RB-00P6-35	35.0	0.6	
	N700E-037LF	RB-00P6-35	35.0	0.6	RB-01P2-35	35.0	1.2	
	N700E-055LF	RB-01P0-17	17.0	1.0	RB-01P2-17	17.0	1.2	
	N700E-075LF							
	N700E-110LF							
	N700E-150LF	RB-02P5-8.7	8.7	2.5	RB-04P5-8.7	8.7	4.5	
	N700E-185LF	RB-03P0-6	6.0	3.0	RB-05P6-6	6.0	5.6	
	N700E-220LF	RB-04P0-6	6.0	4.0	RB-06P6-6	6.0	6.6	
400V	N700E-004HF	RB-00P3-180	180.0	0.3	RB-00P3-180	180.0	0.3	Default Inclusion
	N700E-007HF							
	N700E-015HF							
	N700E-022HF	RB-00P3-100	100.0	0.3	RB-00P6-100	100.0	0.6	
	N700E-037HF	RB-00P6-100	100.0	0.6	RB-00P6-100	100.0	0.6	
	N700E-055HF	RB-01P2-70	70.0	1.2	RB-01P8-70	70.0	1.8	
	N700E-075HF	RB-01P2-50	50.0	1.2	RB-02P4-50	50.0	2.4	
	N700E-110HF	RB-02P0-50	50.0	2.0	RB-03P3-50	50.0	3.3	
	N700E-150HF	RB-02P5-30	30.0	2.5	RB-04P5-30	30.0	4.5	
	N700E-185HF	RB-03P0-20	20.0	3.0	RB-05P6-20	20.0	5.6	
	N700E-220HF	RB-04P0-20	20.0	4.0	RB-06P6-20	20.0	6.6	
	N700E-300HF	RB-05P0-12	12.0	5.0	RB-09P0-12	12.0	9.0	Option
	N700E-370HF	RB-06P0-12	12.0	6.0	RB-11P2-12	12.0	11.2	
	N700E-450HF	RB-07P0-8	8.0	7.0	RB-13P5-8	8.0	13.5	
	N700E-550HF	RB-08P5-8	8.0	8.5	RB-16P5-8	8.0	16.5	
	N700E-750HF	RB-11P2-6	6.0	11.2	RB-22P5-6	6.0	22.5	
	N700E-900HF	RB-11P2-6 (x2)	6.0 (x2)	11.2	RB-22P5-6 (x2)	6.0 (x2)	22.5	
	N700E-1100HF							
	N700E-1320HF							
	N700E-1600HF	RB-22P5-3 (x2)	3.0 (x2)	22.5	RB-45P0-3 (x2)	3	45.0	
	N700E-2200HF							
	N700E-2800HF							
	N700E-3500HF	RB-33P7-2 (x2)	2.0 (x2)	33.7	RB-67P5-3 (x2)	2	67.5	

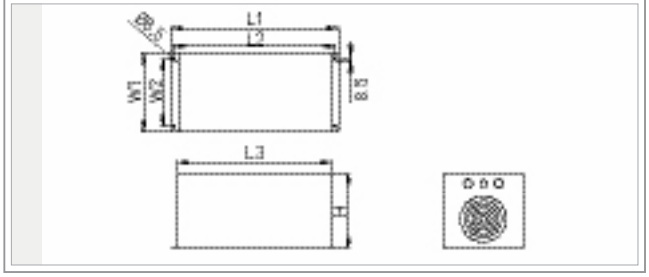
Brake Resistor Drawing / Size

A TYPE : RB-01P0 ~ RB-02P0



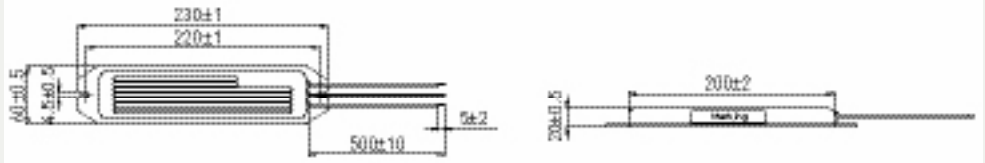
A TYPE	L1	L2	L3	W1	W2	H
RB-01P0	340	385	302	70	39	45
RB-01P2	400	495	362			
RB-01P8 ~ RB-02P0	510		472			

B TYPE : RB-02P4 ~ RB-22P5

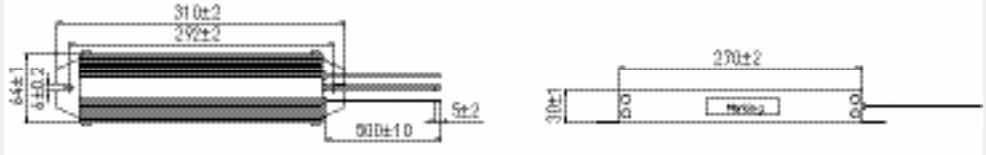


B TYPE	L1	L2	L3	W1	W2	H
RB-02P4 ~ RB-02P5	550	530	503	180	140	126
RB-03P0				260	220	126
RB-04P0 ~ RB-05P6				180	140	182
RB-06P6				260	220	182
RB-08P0 ~ RB-09P0						252
RB-11P2 ~ RB-13P5				260	220	322
RB-16P5						392
RB-22P5				340	300	392

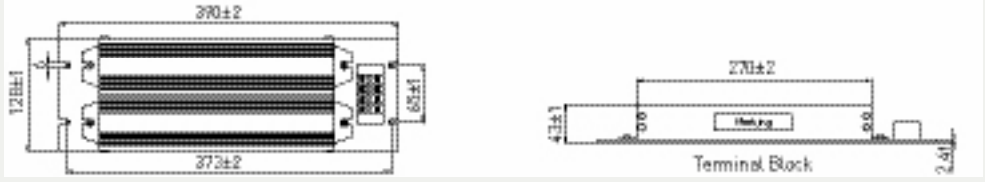
C TYPE : RB-00P3



D TYPE : RB-00P6



E TYPE : RB-01P2



For Correct Operation

☐Before use, be sure to read through the Instruction manual to insure proper use of the inverter.
☐Note that the inverter requires electrical wiring; a trained specialist should carry out the wiring.
☐The inverter in this catalogue is designed for general industrial applications. For special applications in fields such as aircraft, nuclear power, transport, vehicles, clinics, and underwater equipment, please consult us in advance.
☐For application in a facility where human life is involved or serious losses may occur, make sure to provide safety devices to avoid a serious accident.
☐The inverter is intended for use with a three-phase AC motor. For use with a load other than this, please consult with us.

☐ Application to Motors | Application to General-purpose Motors

Operating Frequency	The overspeed endurance of a general-purpose motor is 120% of the rated speed for 2minutes (JIS C4004). For operation at higher than 60Hz, it is required to examine the allowable torque of the motor, useful life of bearings, noise, vibration, etc. In this case, be sure to consult the motor manufacturer as the maximum allowable rpm differs depending on the motor capacity, etc.
Torque Characteristics	The torque characteristics of driving a general-purpose motor with an inverter differ from those of driving it using commercial power (starting torque decreases in particular). Carefully check the load torque characteristic of a connected machine and the driving torque characteristic of the motor.
Motor Loss and Temperature Increase	An inverter-driven general-purpose motor heats up quickly at lower speeds. Consequently, the continuous torque level (output) will decrease at lower motor speeds. Carefully check the torque characteristics and speed range requirements.
Noise	When run by an inverter, a general-purpose motor generates noise slightly greater than by commercial power.
Vibration	When run by an inverter at variable speeds, the motor may generate vibrations, especially because of (a) unbalance of the rotor including a connected machine, or (b) resonance caused by the natural vibration frequency of a mechanical system. Particularly, be careful of (c) when a machine previously fitted with a constant speed is operated at variable speed. Vibration can be minimized by (1) avoiding resonance points by using the frequency jump function of the inverter, (2) using a tire-shaped coupling, or (3) placing a rubber shock absorber under the motor base.
Power Transmission Mechanism	Under continued, low-speed operation, oil lubrication can deteriorate in a power transmission mechanism with an oil type gear box (gear motor) or transmission. Check with the motor manufacturer for the permissible range of continuous speed. To operate at more than 60Hz, confirm the machine's ability to withstand the centrifugal force generated.

☐ Application to Motors | Application to Special Motors

Gear Motor	The allowable rotation range of continuous drive varies depending on the lubrication method or motor manufacturer (Particularly in case of oil lubrication, pay attention to the low frequency range). Grease lubrication has no degradation of lubrication ability even when the number of rotation decreases (Allowable frequency range: 6~120Hz).
Brake-equipped Motor	For use of a brake-equipped motor, power supply for braking operation should be separately prepared. Connect the braking power supply to the primary side power of the inverter. Use brake operation (inverter stop) and free run stop (FRS) terminal to turn off inverter power.
Pole-change Motor	There are different kinds of pole-change motors (constant output characteristic type, constant torque characteristic type, etc.), with different rated current values. In motor selection, check the maximum allowable current for each motor of a different pole count. At the time of pole change, be sure to stop the motor.
Submersible Motor	The rated current of a submersible motor is significantly larger than that of the general-purpose motor. In inverter selection, be sure to check the rated current of the motor.
Explosion-proof Motor	Inverter drive is not suitable for a safety-enhanced explosion-proof type motor. The inverter should be used in combination with a pressure-proof and explosion-proof type of motor. ☐☐ Explosion-proof verification is not available for N700E series.
Synchronous (MS) Motor / High-speed (HFM) Motor	In most cases, the synchronous (MS) motor and the high-speed (HFM) motor are designed and manufactured to meet the specifications suitable for a connected machine. As to proper inverter selection, consult the manufacturer.
Single-phase Motor	A single-phase motor is not suitable for variable-speed operation by an inverter drive. Therefore, use a three-phase motor.

☐ Application to Motors | Application to the 400V-class Motor

A system applying a voltage-type PWM inverter with IGBT may have surge voltage at the motor terminals resulting from the cable constants including the cable length and the cable laying method. Depending on the surge current magnification, the motor coil insulation may be degraded. In particular, when a 400V class motor is used, a longer cable is used, and critical loss can occur. Take the following countermeasures : (1) install the LCR filter between the inverter and the motor,(2) install the AC reactor between the inverter and the motor, or (3) enhance the insulation of the motor coil.

☐ Notes on Use | Drive

Run/Stop	Run or stop of the inverter must be done with the keys on the operator panel or through the control circuit terminal. Installing an electromagnetic contactor (Mg) should not be used as a switch of run/stop.
Emergency Motor Stop	When the protective function is operating or the power supply stops, the motor enters the free run stop state. When emergency stop or protection of motor is required, use of a mechanical brake should be considered.
High-frequency Run	N700E series can be set up to 400Hz. However it is extremely dangerous for rotational speed of two-pole motor to reach up to approx 24,000rpm. Therefore, carefully make selection and settings after checking the mechanical strength of the motor and connected machines. Consult the motor manufacturer when it is necessary to drive a standard (general-purpose) motor above 60Hz.

□ Notes on Use | Installation Location and Operating Environment

Avoid installation in areas of high temperature, excessive humidity, or easy condensation of dew, as well as areas that are dusty, subject to corrosive gases, residue of grinding solution, or salt. Install the inverter away from direct sunlight in a well-ventilated room that is free of vibration.
The inverter can be operated in the ambient temperature range from -10℃ to 50℃

□ Notes on Use | Main Power Supply

Installation of an AC reactor on the Input Side

In the following examples involving a general-purpose inverter, a large peak current flows on the main power supply side, and could destroy the converter module. When such situations are predictable or connected crucial device is required to meet high reliability, install an AC reactor between the power supply and the inverter. Also, when influence of indirect lightning strike is possible, install a lightning arrester.

A) The unbalance factor of the power supply is 3% or higher1.[1)]
B) The power supply capacity is at least 10 times greater than the inverter capacity (the power supply capacity is 500kVA or more).
C) Abrupt power supply changes are expected.
Examples) ① Several inverters are interconnected with a short bus.
② A thyristor converter and an inverter are interconnected with a short bus.
③ Junction and disjunction of installed phase advance capacitor.
In cases (A), (B) and (C), it is recommended to install an AC reactor on the main power supply side.

1) Example of how to calculate voltage unbalanced ratio. (voltage between lines on RS: VRS=205V, voltage between lines on ST : VST=201V, voltage between lines on TR: VTR=200V), max voltage between lines-average between lines= VRS-(VRS+VST+VTR)/3=205-202

$$\text{·Voltage unbalanced ratio} = \frac{\text{Max. voltage between lines} - \text{Average voltage between lines}}{\text{Average voltage between lines}} \times 100 = \frac{\text{VRS}-(\text{VRS}+\text{VST}+\text{VTR})/3}{(\text{VRS}+\text{VST}+\text{VTR})/3} \times 100 = \frac{205-202}{202} \times 100 = 1.5(\%)$$

Using an Independent Electric Power Plant

If an inverter is run by an independent electric power plant, harmonic current can cause to overheat the generator or distort output voltage waves of the generator. Generally, the generator capacity should be five times that of the inverter (kVA) in a PWM control system, or six times greater in a PAM control system.

□ Notes on Peripheral Equipment Selection

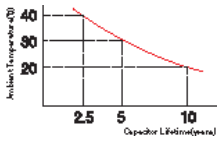
Wiring Connections		(1) Be sure to connect main power wires with R (L1), S (L2), and T (L3) (input) terminals and motor wires to U (T1), V (T2), and W (T3) terminals (output). (Incorrect connection will cause an immediate failure.) (2) Be sure to provide a grounding connection with the ground terminal ( ) ⏚
Wiring between Inverter and Motor	Electromagnetic Contactor	When an electromagnetic contactor is installed between the inverter and the motor, do not perform on-off switching during running.
	Thermal Relay	When used with standard output motors (standard three-phase squirrel cage four pole motors), the N700E series does not need a thermal relay for motor protection due to the internal electronic protective circuit. A thermal relay, however, should be used: during continuous running out of a range of 30Hz to 60Hz for motors exceeding the range of electronic thermal adjustment (rated current). When several motors are driven by the same inverter, install a thermal relay for each motor. The RC value of the thermal relay should be more than 1.1times the rated current of the motor. Where the wiring length is 10m or more, the thermal relay tends to turn off readily. In this case, provide an AC reactor on the output side or use a current sensor.
Installing a Circuit Breaker		Install a circuit breaker on the main power input side to protect inverter wiring and ensure personal safety. Choose a circuit breaker compatible with inverter.
Wiring Distance		The wiring distance between the inverter and the remote operator panel should be 20meters or less. When this distance is exceeded, use CVD-E (current-voltage converter) or RCD-E (remote control device). Shielded cable should be used on the wiring. Beware of voltage drops on main circuit wires (A large voltage drop reduces torque).
Earth Leakage Relay		If the earth leakage relay (or earth leakage breaker) is used, it should have a sensitivity level of 15mA or more (per inverter). Leakage current is depending on the length of the cable.
Phase Advance Capacitor		Do not use a capacitor for improvement of power factor between the inverter and the motor because the high-frequency components of the inverter output may overheat or damage the capacitor

□ High-frequency Noise and Leakage Current

(1) High-frequency components are included in the input/output of the inverter main circuit, and they may cause interference in a transmitter, radio, or sensor if used near the inverter. The interference can be minimized by attaching noise filters (option) in the inverter.
(2) The switching of an inverter causes an increase of leakage current. Be sure to ground the inverter and the motor.

□ Lifetime of Primary Parts

Because a DC bus capacitor deteriorates as it undergoes internal chemical reaction, it should normally be replaced every five years. Be aware, however, that its life expectancy is considerably shorter when the inverter is subject to such adverse factors as high temperatures or heavy loads exceeding the rated current of the inverter. The figure at the right shows the approximate lifetime of the capacitor when it is used 24hours. Also, such moving parts as a cooling fan should be replaced. Maintenance, inspection and replacing parts must be performed by only specified professional engineers.



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